REMARKS

The Office Action of July 12, 2010, has been carefully studied. Claims 13-19 and 21-29 currently appear in this application. These claims define novel and unobvious subject matter under Sections 102 and 103 of 35 U.S.C., and therefore should be allowed. Applicant respectfully requests favorable reconsideration and formal allowance of the claims.

What is Claimed

The flexible shock-absorbing assembly and carrier claimed herein are made of two flexible films in which pockets are formed. The pockets are filled with a shock attenuating material. The shock attenuating material is flowable, and preferably comprises volcanic foam glasses, perlite, vermiculite and pumice.

The assembly as claimed provides a unique way of packaging a known shock attenuating material in such form that the shock attenuating material can be made available to protect a variety of types of structures. The assembly is light and flexible and has been repeatedly demonstrated to protect against the deleterious effects of shock waves resulting from explosions.

Explosions differ from a single impact situation because explosions produce shock waves, which produce the highly damaging phenomenon known as blast. Rather than a single impact, shock waves are a plurality of pressure waves. Once produced, the shock waves propagate outward from the source of the explosion. When shock waves pass into the attenuating material, turbulent

zones are created along with large numbers of miniature shock waves as energy from the shock wave passes into and through the flowable attenuating medium. The attenuating medium absorbs substantial energy form the chock wave, which is enhanced by confinement within the cells or recesses.

The assembly claimed herein uses a granular, crushable material that has energy absorbing properties. This material neither stiffens nor hardens when impacted by a shock wave, but is rapidly compressed and crushed to a fine powder, thus absorbing shock energy. The shock attenuating mate ail used in the herein claimed assembly is designed not to resist shock force but to be consumed and destroyed by that force. The flexibility of the assembly allows it to be formed around structures of any shape.

Claim Amendments

The claims have been amended to recite that the shock attenuating material is selected from the group consisting of volcanic foam glasses, perlite, vermiculite and pumice. These shock attenuating materials have been found to be particularly useful in attenuating shock waves because they are frangible and collapse, absorbing energy from shock waves. Support for this amendment can be found in the specification as filed at paragraph [0043].

Rejections under 35 U.S.C. 112

Claim 20 is rejected under 35 U.S.C. 112, second paragraph, for being indefinite for failing to point out and distinctly claim the subject matter which applicant regards as the invention.

As the present amendment cancels claim 20, this rejection is now moot.

Art Rejections

Claims 13 and 17-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rhoades et al., Us 6,701,529 in view of Gulbierz, US 3,801,416 and Carlson, US 6961957.

This rejection is respectfully traversed.

Rhoades discloses a padding system using an energy absorbent medium that is a blend of polysiloxane polymer that exhibits a high degree of intermolecular bonding, a lubricant which is preferably a hydrocarbon-based grease or fluid, and a filler that can be selected from microspheres, powdered plastics, ceramics, metals or fibers and pumps mineral filler. The flexible sheet or film is said to be relatively non-porous to maintain the silicone polymer in a fluid state, whereas the film of the presently claimed assembly is sufficiently porous to admit acoustic or shock waves to penetrate the film so as to contact the shock attenuating material.

Unlike the presently claimed shock-attenuating assembly, in which the shock attenuating material absorbs energy by being crushed, the Rhoades "energy absorbing" medium, when a sudden high impact force is applied, becomes more rigid with an increasing rate of deformation. That is, the Rhoades assembly, upon impact, exhibits an increase in elastic modulus with time or suddenly applied force or stress. Thus, the Rhoades device becomes more rigid

upon impact, and is designed for a situation in which there is a single blow or a small number of blows to the device. In contrast thereto, the presently claimed assembly is for absorbing shock waves from a blast, which shock waves come in multiples. Upon exposure to a plurality of shock waves, the Rhoades device, unlike the assembly claimed herein, would merely become more and more rigid, and would be unable to attenuate the shock waves.

Gulbierz adds nothing to Rhoades, as Gulbierz merely discloses that textile material, such as nylon, can be used in blast-containment devices. Using the polyamide of Gulbierz in the assembly of Rhoades would not cure the deficiency of the siloxane polymer used in Rhoades, because this polymer becomes more rigid upon exposure to pressure. Moreover, the Gulbierz blanket is designed to absorb blast fragments emanating from explosive devices after detonation. The blanket is designed to confine fragments of a higher mass and a higher velocity than heretofore possible. This is not at all the same as mitigating shock waves from an explosion.

While Carlson teaches a plurality of seams around pockets in Figure 5, it is clear that these pockets are not intended to make the assembly sufficiently flexible so as to surround a structure of any shape. It is clear from the description of Figure 5, beginning at paragraph 0031, that the vest includes a frame 62 attached to the layers of ballistic material 44. The frame is made of low-density plastic or other semi-rigid material. The frame distributes energy across the surface of the ballistic panel. Paragraph 0033 describes the action of

the armor: in a ballistic event, the projectile strikes the ballistic materials and energy is transferred to the frame via the fibers in the ballistic fabric. The ballistic fabric is Kevlar® or other types of nylon fibers. There is nothing in Carlson that even suggests that the pockets are used to retain blast-mitigating material.

Combining Carlson with Rhoades would not give the flexible assembly claimed herein, as there is nothing in Carlson that would even suggest producing an assembly that can be used to surround a structure having any shape. In fact, the Carlson assembly is more rigid than the Rhoades assembly, and the Rhoades assembly becomes rigid upon impact.

Reconsideration and withdrawal of the rejection are respectfully requested.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Rhoades in view of Gulbierz and Carlson and further in view of Gettle, US 5,394,786.

This rejection is respectfully traversed.

Gettle discloses perlite as a shock-absorbing material, but the Gettle structure is a rigid enclosure. Moreover, none of Rhoades, Gulbierz or Carlson discloses a shock attenuating material such as claimed herein, and there is no reason to believe that one would want to put a shock attenuating material in the structures of Rhoades, Gulbierz or Carlson. Rhoades discloses a structure for absorbing energy from an applied force. It is clear that this material is not

designed to mitigate shock waves, as the first force applied to the Rhoades polymer makes the polymer rigid; and additional force would only make the polymer additionally rigid, which would not help in mitigating a plurality of shock waves. Gulbierz discloses that polyamide can be used to absorb blast fragments. These are physical pieces of an explosive device, not shock waves propagated by the explosion. Carlson discloses a ballistic vest designed to designed to protect the wearer from injury by bullets or other ballistic devices. This is not the same as absorbing or mitigating shock waves.

The fact that Gettle discloses that perlite is a shock attenuating material adds nothing to the combination of Rhoades, Gulbierz and Carlson, because Gettle encloses the perlite in a rigid frame. Combining these four references would not lead to a flexible assembly containing blast mitigating material that is sufficiently flexible to surround a structure of any shape, that is, can protect almost any type of structure with blast mitigating material.

Reconsideration and withdrawal of the rejection are respectfully requested.

Claims 13 and 17-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bainbridge et al., US 6,453,477 in view of Bainbridge, 7,662,468.

This rejection is respectfully traversed.

Bainbridge '477 discloses protective padding for sports gear. Contrary to the Examiner's assertion that beads 22 are a shock attenuating

material selected from the group consisting of volcanic foam glass, perlite, vermiculite and pumice, which are crushable upon contact with a shock wave, the beads 22 in Bainbridge '477 are made of elastic material. The beads are initially in compressed states within the casing and place the outer, inelastic casing in tension. When a blow or force is applied, the beads are further compressed to absorb and dissipate the impact. Additionally, the applied blow or force will increase the tension in the outer casing to compress the beads even further. [column 2, lines 54-58]

This compression of the beads in Bainbridge '477 is contrary to the herein claimed assembly, in which the material is crushed upon contact with a shock wave. This crushing of the material absorbs the energy of the shock wave.

Bainbridge '468 adds nothing to Bainbridge '477, because there is no teaching or suggestion in Bainbridge '468 that polyamide can be used as one of two flexible films incorporating a blast mitigating material in pockets formed in the two flexible sheets. Polyamide is a well known polymer that has many uses, but there is neither teaching nor suggestion in the two Bainbridge patents of using polyamide as an enclosure or carrier for the blast mitigating materials used in the assembly claimed herein. The Bainbridge beads are compressible, rather than crushable, and are used for protection in contact sports.

Reconsideration and withdrawal of the rejection are respectfully requested.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bainbridge '477 and Bainbridge '468 in view of Gettle.

This rejection is respectfully traversed.

As discussed *supra*, there is nothing in either Bainbridge patent that even suggests a blast resistant material. The fact that Gettle discloses perlite as a filler adds nothing to the Bainbridge disclosures.

In view of the above, it is respectfully submitted that the claims are now in condition for allowance, and favorable action thereon is earnestly solicited.

Respectfully submitted,

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